



# Jutta Paulus MdEP



## Recycling of plastics in the European Union – obstacles, opportunities and outlook



Strategies for a circular economy in plastics - The role of European diversity - VCW

# ACHEMA

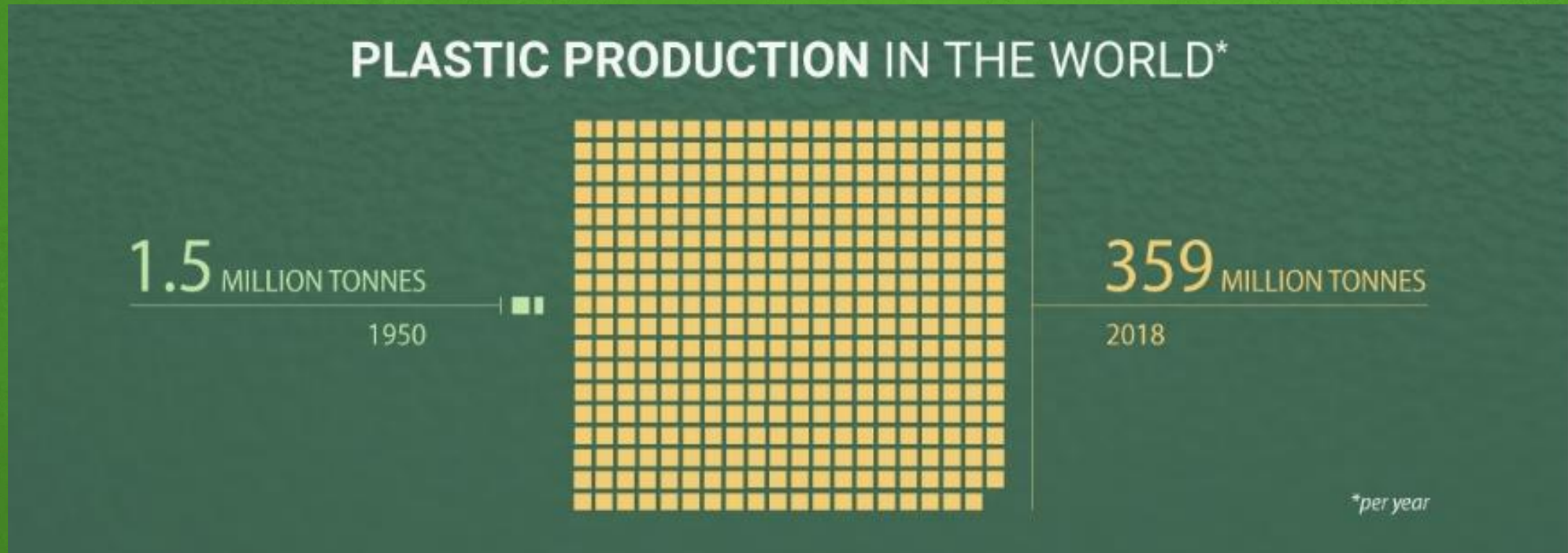
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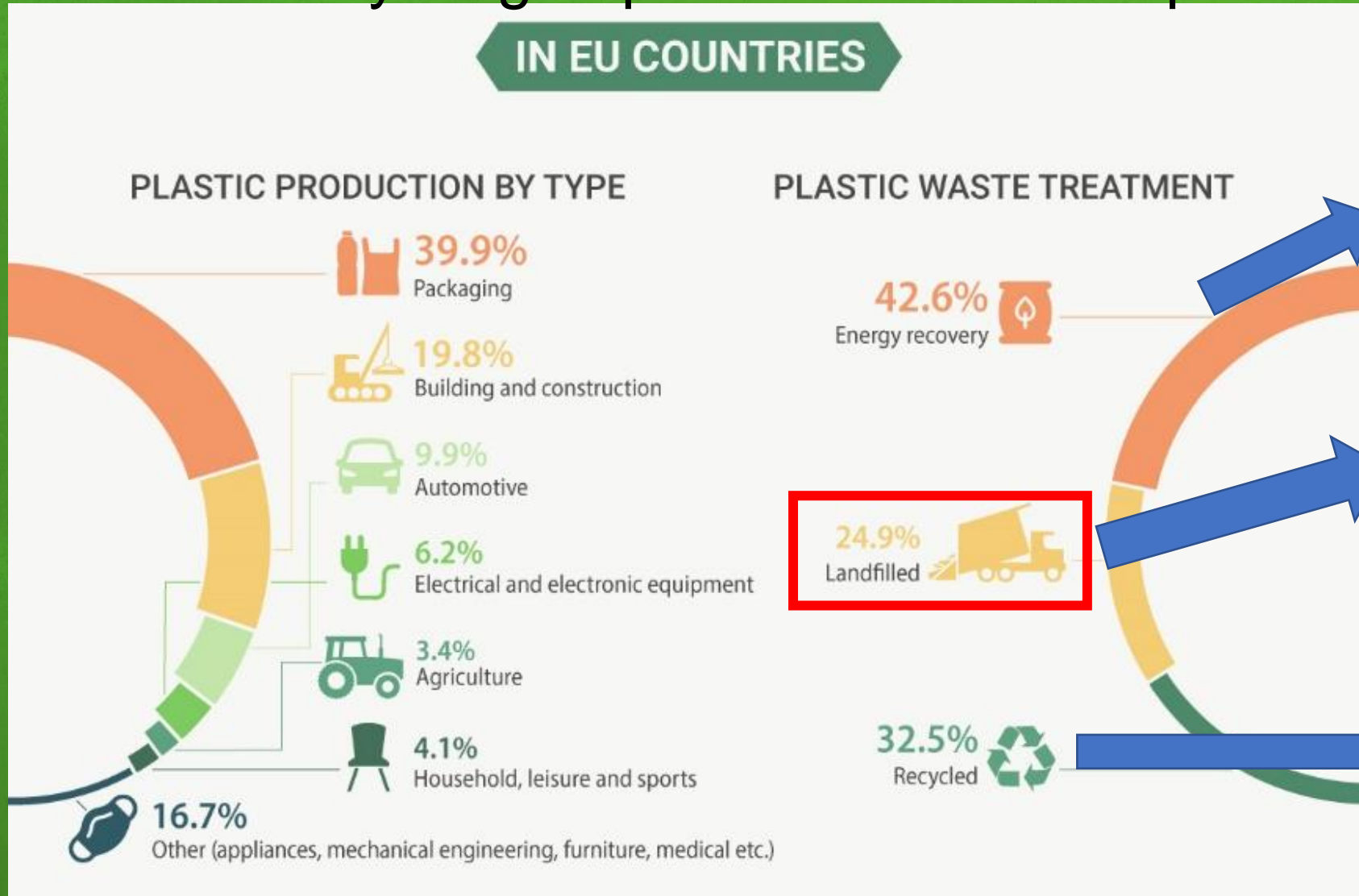
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# Current state of recycling of plastics in the European Union



<https://www.europarl.europa.eu/news/en/headlines/society/20181212STO21610/plastic-waste-and-recycling-in-the-eu-facts-and-figures>

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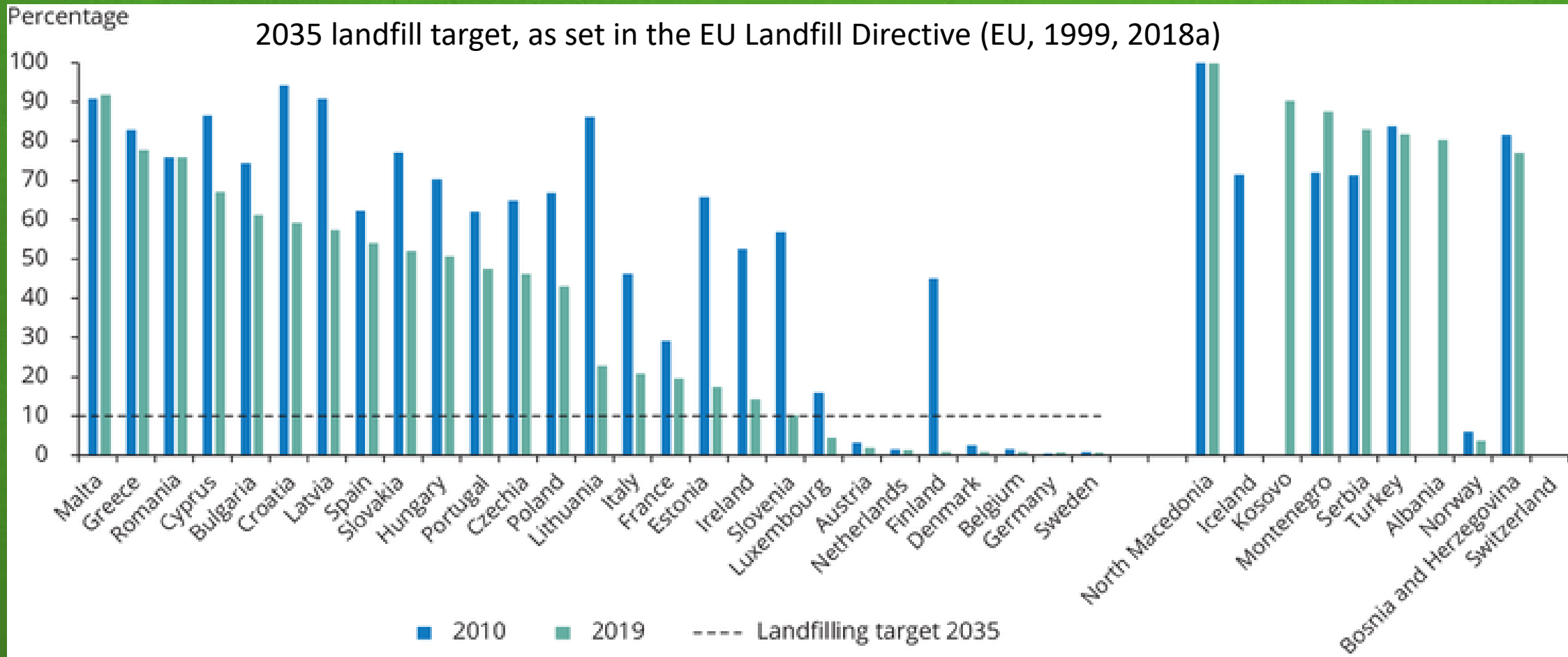
Globally the incineration of plastic waste sums up to 850Mt CO<sub>2</sub> eq in 2019 → could rise to 2.8Gt in 2050!

In 2021 16 Member States had landfill restrictions  
23 MS had landfill taxes  
2 MS had none (CY,MT)

50 % exported to Asia for further processing  
!Different calculation of what is recycled in different MS!

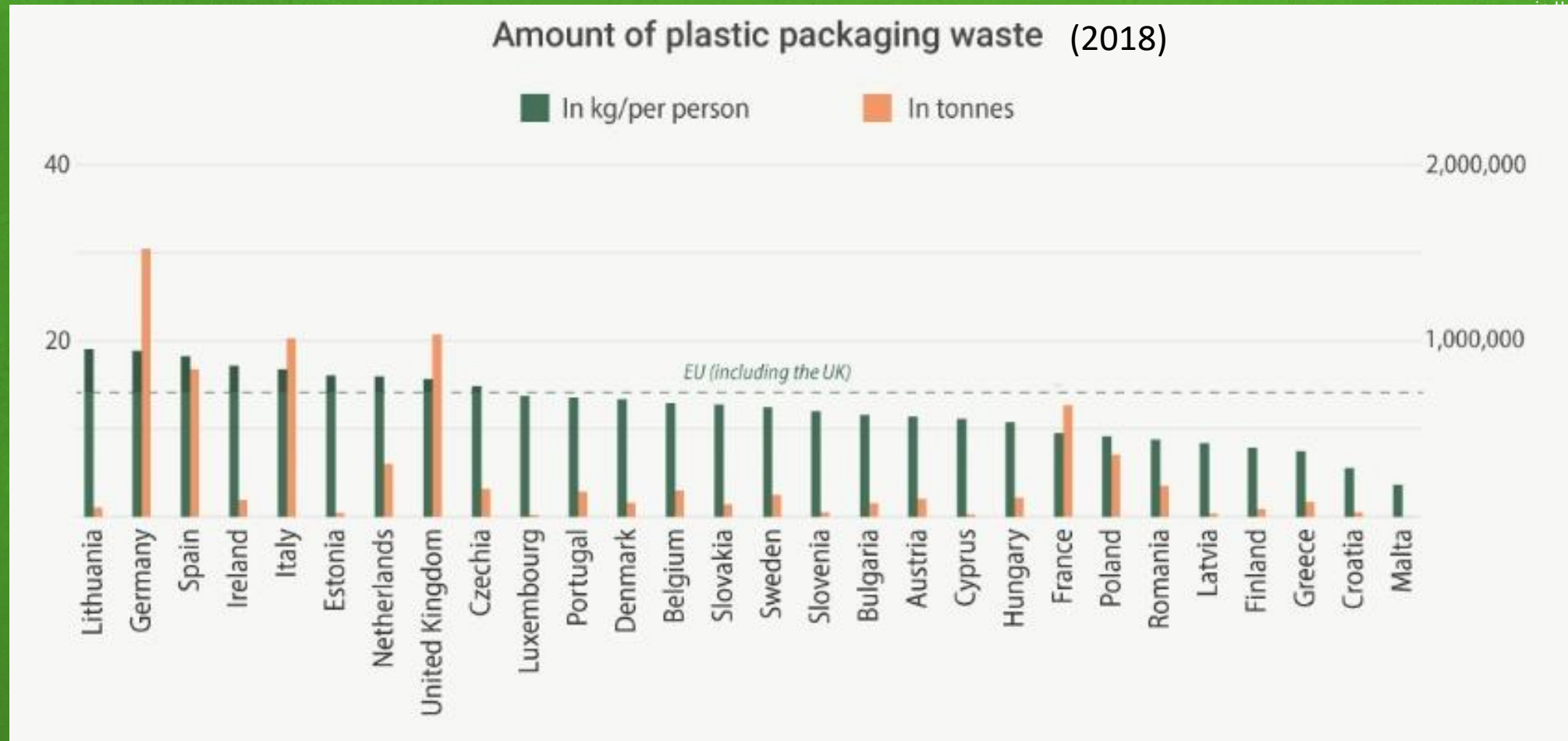
<https://www.europarl.europa.eu/news/en/headlines/society/20181212STO21610/plastic-waste-and-recycling-in-the-eu-facts-and-figures>

# Municipal waste landfill rates in Europe by country



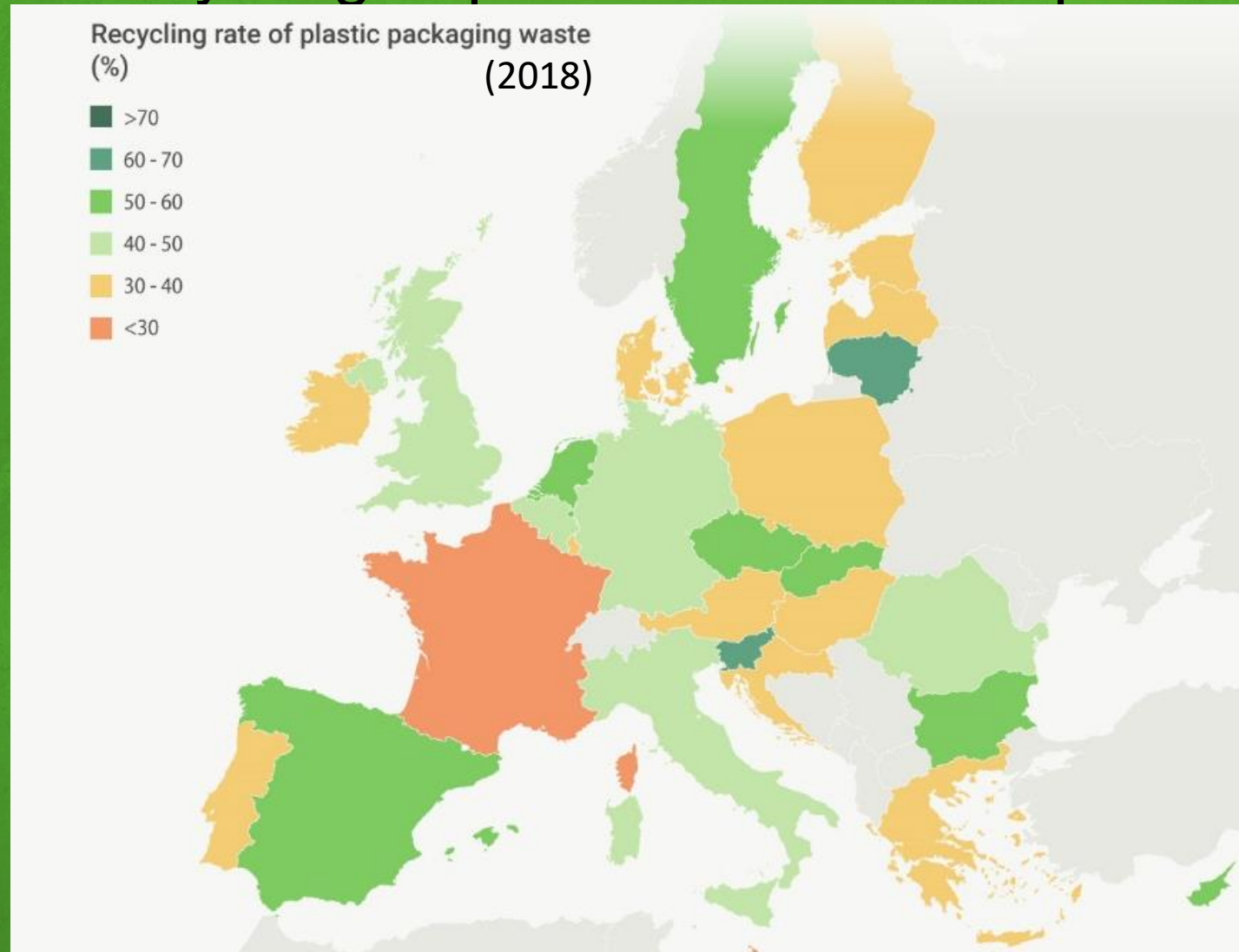
<https://www.eea.europa.eu/data-and-maps/figures/municipal-waste-landfill-rates-in>

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# Impact of plastics on climate, oceans, environment and economy



Globally the **incineration** of plastic waste sums up to approx. **850 Mt CO<sub>2</sub> eq in 2019**

(if this would be a county it would be on rank 6 behind Japan 1154 Mt and before Germany 702 Mt in the emission ranking list 2019)

→ could rise to 2.8 Gt in 2050!

→ Throughout their lifecycle, plastics have a significant carbon footprint and emit **3.4% of global greenhouse gas emissions** (2019)

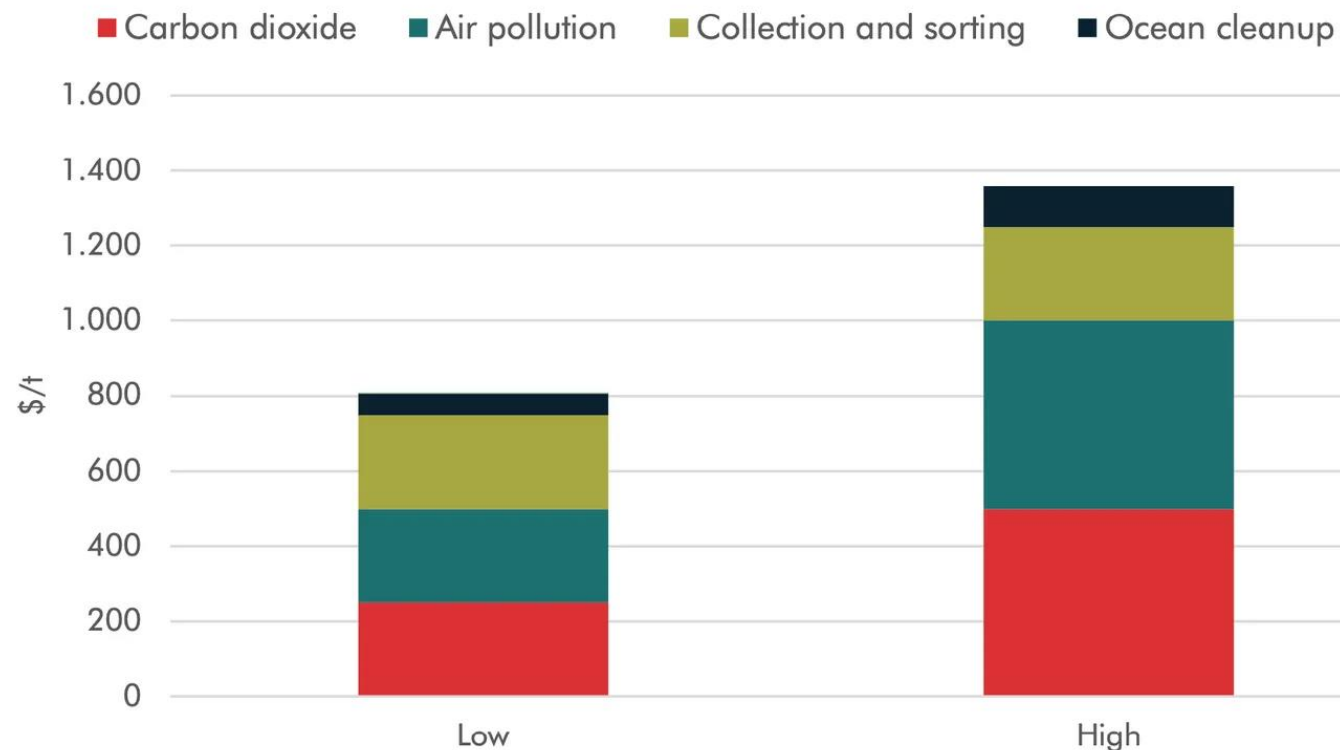
The **low share of plastic recycling in the EU means significant losses for the economy** as well as for the environment. It is estimated that 95 % of the value of plastic packaging material is lost to the economy after a short first-use cycle

- Approx. 8 Gt plastic produced since the 1950s + 300Mt every year
- Approx. **150 Mt plastic in the oceans** + 8 Mt every year
- **Microplastic found in 80% of the blood samples** tested by scientists
- Plastics production accounts for about **4 % of global oil production** (2012).
- **40 % of plastic waste is mismanaged** — 5 % ends up in ocean leakage, 22 % in open burning, and 14 % in terrestrial leakage

# External costs of plastics

- costs to society: carbon dioxide emission during the whole value chain, air pollution, collection, cleanup
- Estimated 800-1400\$/t external costs
- doesn't include:
  - microplastics
  - “terrestrial leakage” (global leakage to the environment (terrestrial and aquatic) was 22 Mt in 2019)
- Industry gets approx.. 33\$/t subsidies (12 B\$ cumulative subsidies vs. 2B\$ taxes paid)

FIGURE 7. PLASTIC EXTERNALITIES PER TONNE \$



Source: EPA, CREA, WHO, UNEP, CT estimates, SYSTEMIQ

<https://www.vox.com/energy-and-environment/21419505/oil-gas-price-plastics-peak-climate-change>



# Oil prices and plastic recycling

## Cost Cliff

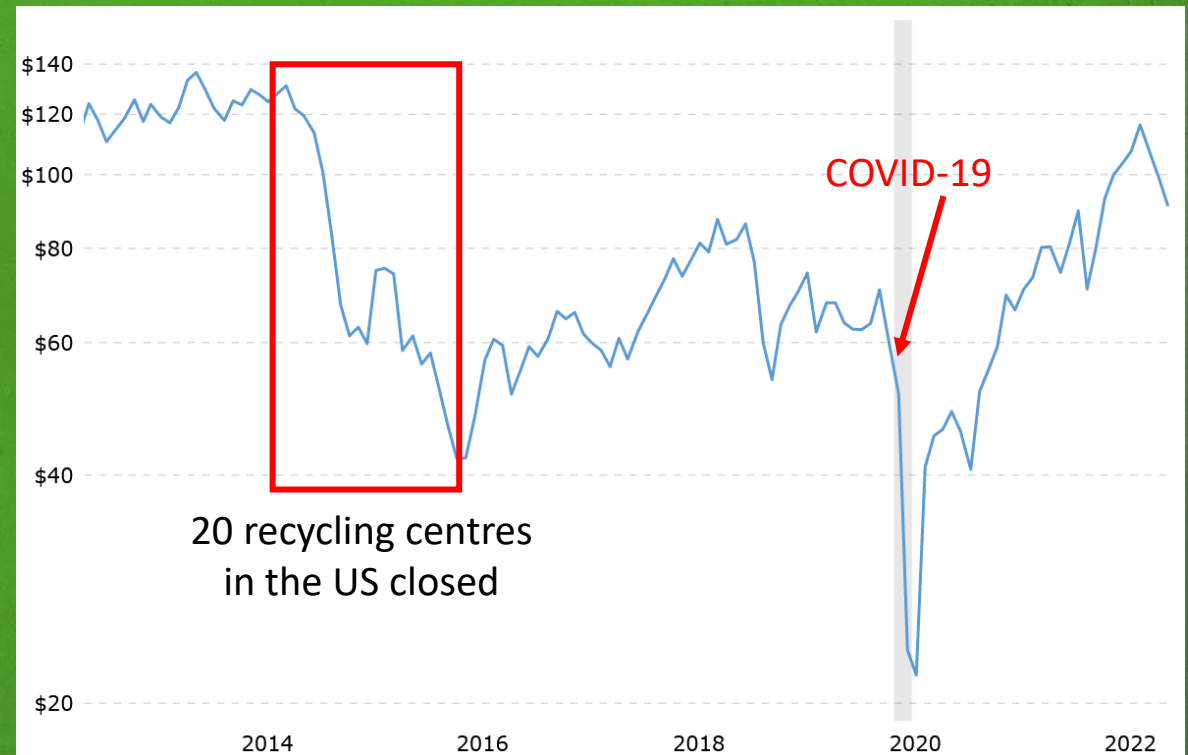
Spot prices for virgin plastic PET have dropped as coronavirus lockdowns hit oil and gas inputs. That's not helping recycled plastic compete.



Source: BloombergNEF, Asia Benchmark

Bloomberg Green

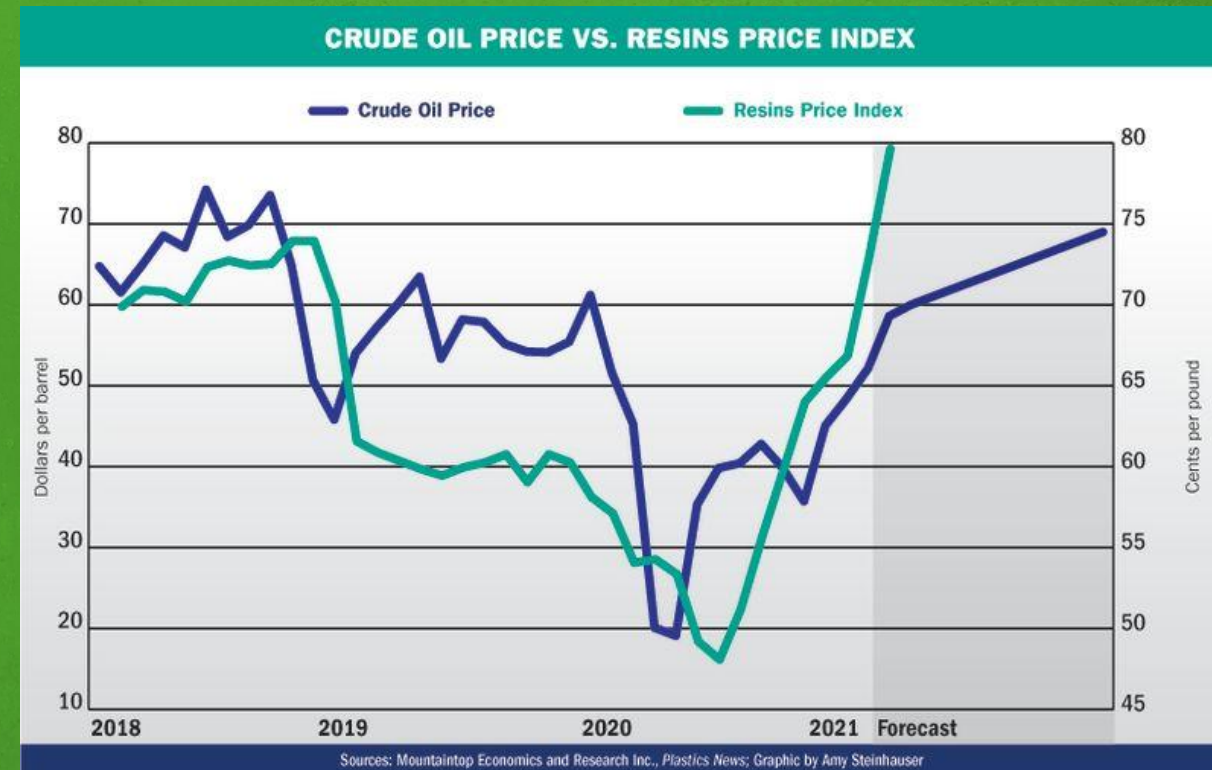
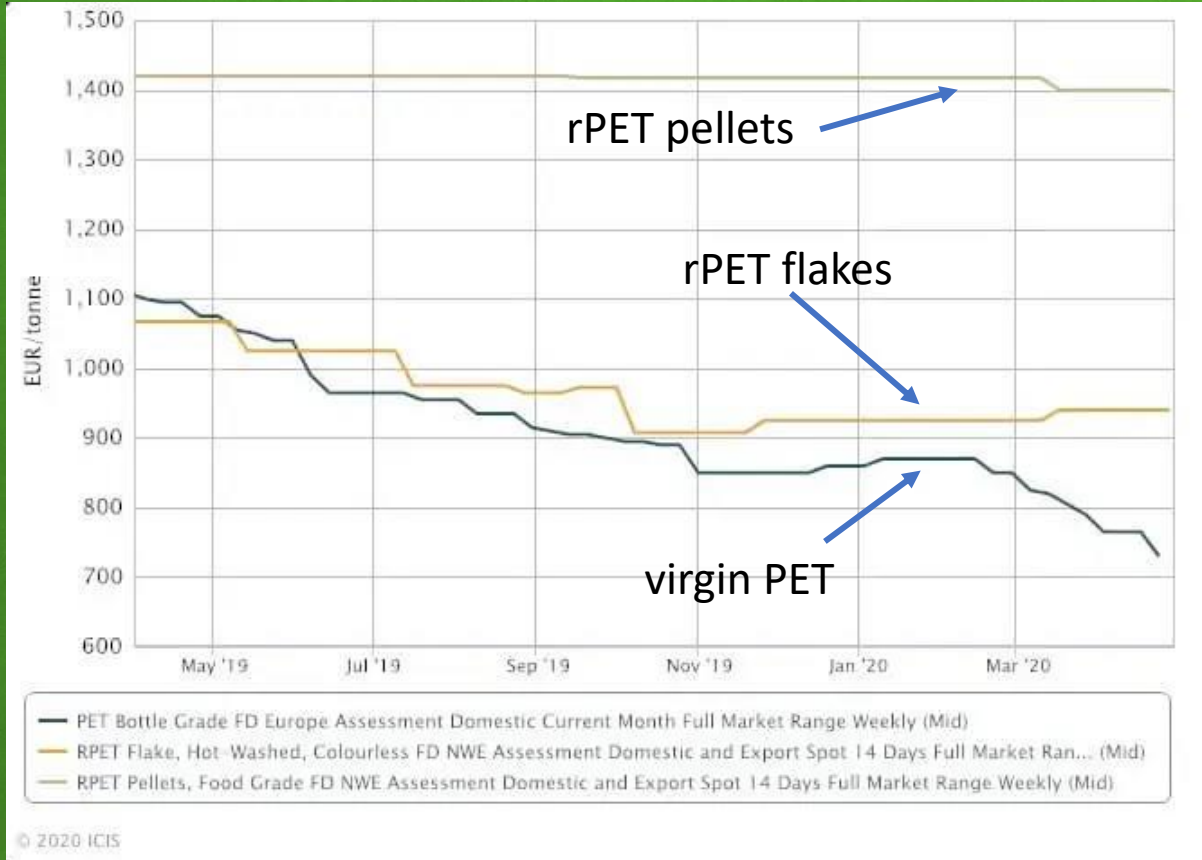
## Global crude oil price \$/barrel, Aug12-Aug22



<https://www.preventedoceanplastic.com/the-relationship-between-oil-and-plastic-and-what-that-means-for-recycling/>

<https://www.macrotrends.net/1369/crude-oil-price-history-chart>  
<https://www.plasticexpert.co.uk/oil-prices-plastic-recycling/>

# Oil prices and plastic recycling



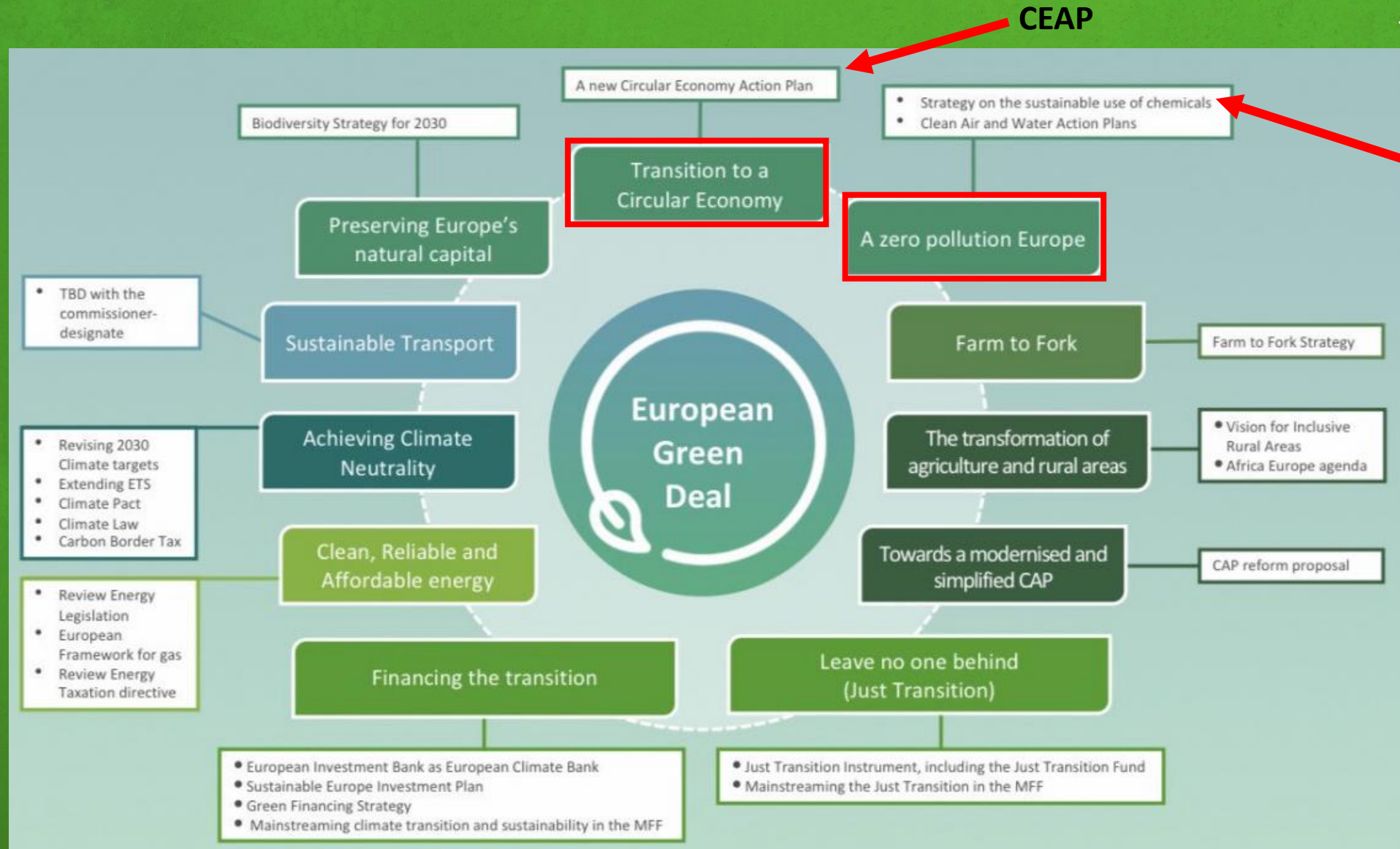
<https://www.plasticityproject.eu/low-oil-prices-downturning-plastic-recycling/>

<https://recykai.com/2021/08/31/effect-of-oil-prices-pet-plastic-recycling/>

# Challenges

- **Additives:** plasticisers, colours, endocrine active substances, flame retardants, ...
- PVC
- Standards virgin plastic vs. recycled plastic (e.g. food packaging)
- No international standards for recycled plastics
- Oil price dependency
- Minimum quantities for recycling in new products would have to be defined by regulator to increase recycling amount independently from oil price
- Multilayered packaging
- Biodegradability only under very specific conditions

# European Green Deal





- **Protection of human health and environment** from harmful chemicals
- Promote innovation for **safe and sustainable chemicals**
- First step towards the **“Zero Pollution Ambition”** for a toxic free environment as part of the **EU Green Deal**
- Ban of harmful chemicals in consumer products.
- Inclusion of mixing effects when assessing the risk of chemicals
- Phase out the authorisation of **per- and polyfluorinated alkyl compounds (PFAS)** in the EU.
  - ECHA submitted in January 2022 a restriction proposal for PFASs used in firefighting foams
  - Germany, the Netherlands, Sweden, Denmark and Norway announced the intention to submit a restriction proposal for PFAS to ECHA in January 2023
  - allowing use of PFAS only where they are essential for society → definition of essential use as in the Montreal protocol could be used: e.g. in medical products

<https://ec.europa.eu/environment/pdf/chemicals/2020/10/chemicals-strategy-factsheet.pdf>



- Increase investment in the development of chemicals that are safe and sustainable throughout their life cycle.
  - Develop chemicals that are safe by design
  - quantitative structure-activity relationship (**QSAR**) models can be used to predict properties of chemicals
- Simplify the authorisation process with a "**one substance, one assessment**" procedure.
- **REACH revision end of 2022**, polymers currently exempt from REACH, challenges in classification with additives

<https://ec.europa.eu/environment/pdf/chemicals/2020/10/chemicals-strategy-factsheet.pdf>

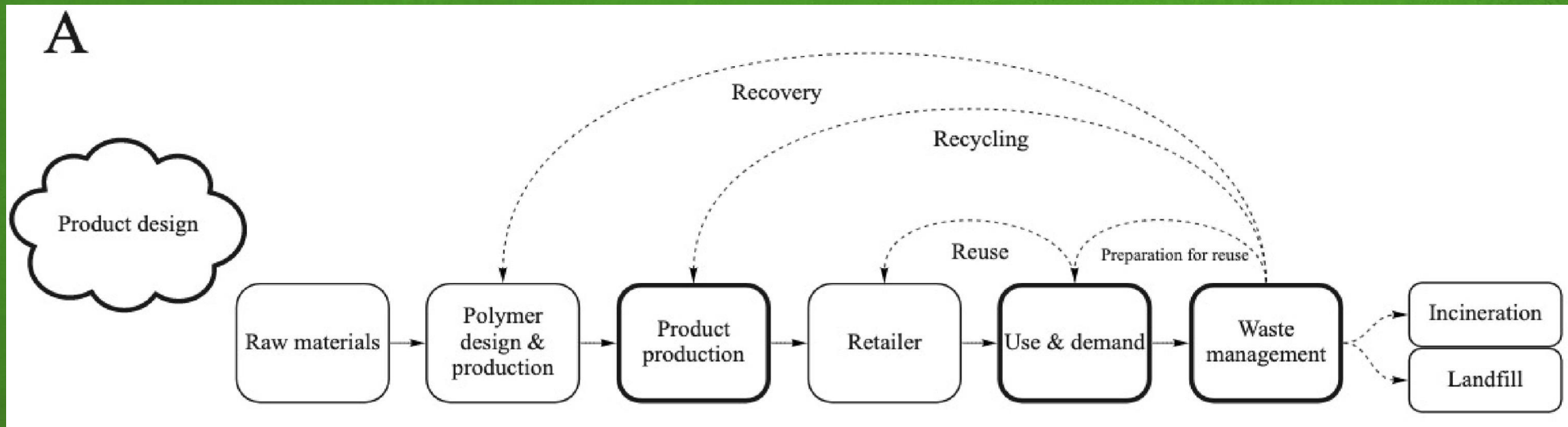


- Adopted March 2020
- Feb2021 **Global Alliance on Circular Economy and Resource Efficiency** (GACERE) launched
  - alliance of governments at the global level: 15 international countries, EU, UNEP, UNIDO (members Feb2022)
- March 2022 European Commission adopted package of measures proposed in the circular economy action plan: **Sustainable Products Initiative, Ecodesign for Sustainable Products Regulation, EU strategy for sustainable and circular textiles**, Construction products Regulation
- April 2022 European Commission adopted proposals for revised **EU measures to address pollution** from large industrial installations
- reduce pressure on natural resources, **create sustainable growth and jobs**, targets how products are designed
- prerequisite to achieve the EU's **2050 climate neutrality target** and to **halt biodiversity loss**
- **Keep resources in the EU economy** for as long as possible
- focus on the sectors that use most resources and where the potential for circularity is high such as: electronics and ICT, batteries and vehicles, **packaging, plastics**, textiles, construction and buildings, food, water and nutrients
- introduces legislative and non-legislative measures targeting areas
- **35 individual actions** listed in the action plan

[https://environment.ec.europa.eu/strategy/circular-economy-action-plan\\_en](https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en)

# Outlook: Circular Plastics Value Chain

- Design for recycling: e.g. single layer packaging / mono material solutions
- Reuse of different plastic products, reusable packaging
- Mechanical recycling, no downcycling!
- Chemical recycling: monomer recycling, feedstock recycling → energy intensive!
- Switch from fossil raw materials to renewable raw material and recycled feedstock



A review of the plastic value chain from a circular economy perspective,  
M. R. Johansen et al., J. Environ, Manage., 302, 2022, 113976




# Thank you for your attention!

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